Provisional Data

R.F TRIODE PENTODE

O·3A INDIRECTLY HEATED

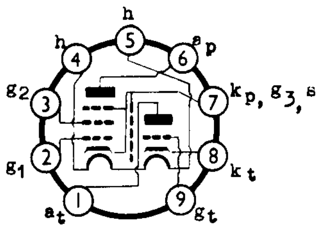
issue. 1.

LZ319

MARCH 1954.

A combined high slope R.F. pentode and low -μ triode primarily designed for use as a frequency changer at frequencies up to 250 Mc/s.

BASE CONNECTIONS & VALVE DIMENSIONS



View from underside of base.

Base	-	B9A
Bulb	-	tubular
Overall length:		56 max. mm
Seated length:		49 max. mm
Diameter:		22.2 max. mm

HEATER

I_h	0.3	A
V_h	9.0	V

RATING

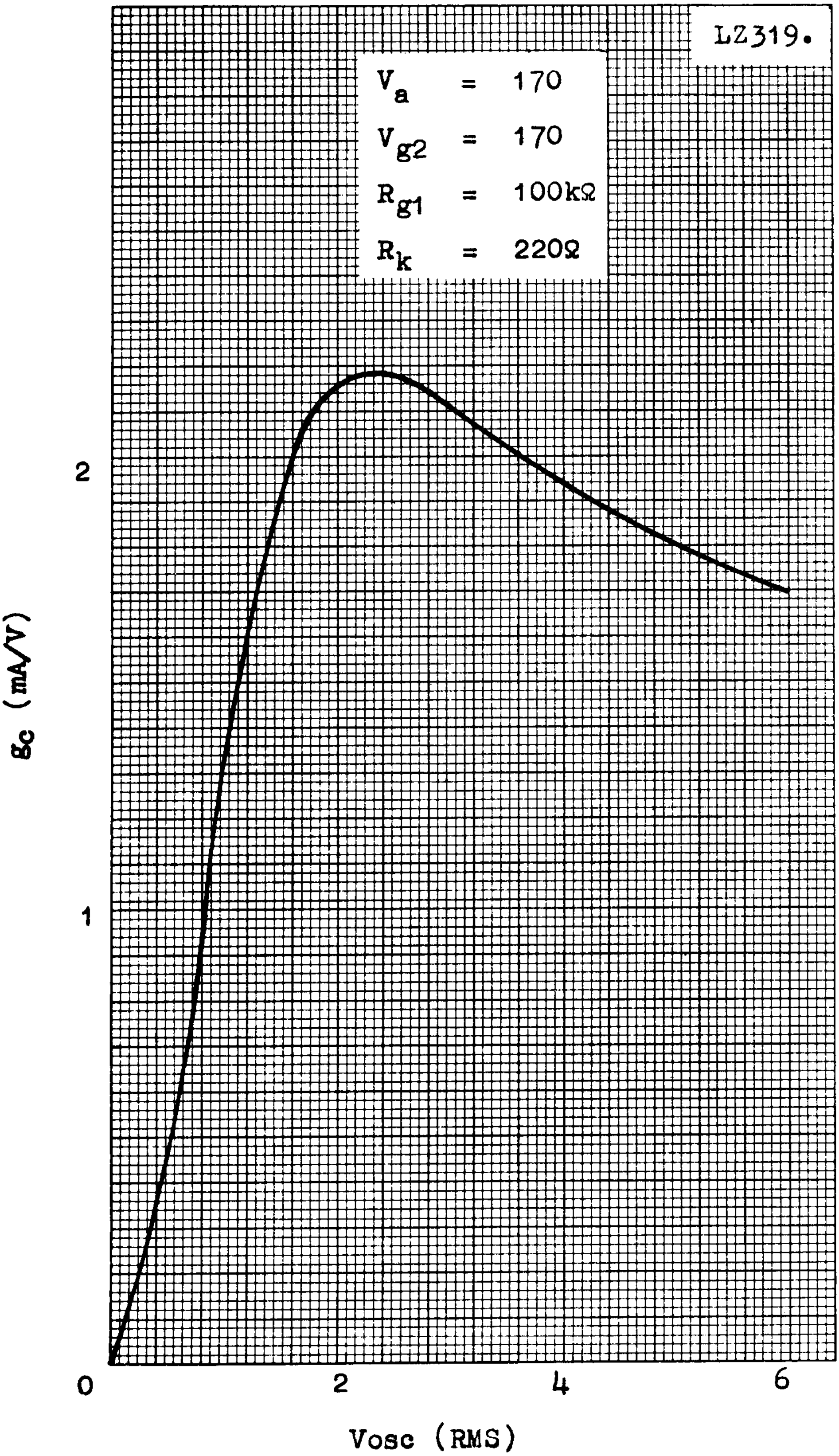
	(Pentode system)	(Triode system)	
V_a	250 max.	250 max.	V
V_{g2}	200 max.		V
V_{h-k}	150 max.	150 max.	V
I_k	14 max.	14 max	mA
p_a	1.7 max.	1.1 max.	W
p_{g2}	0.5 max.		W

CHARACTERISTICS

	(Pentode system)	(Triode system)	
V_a	170	100	V
V_{g2}	170		V
V_{g1}	- 2	-2	V
I_a	10	14	mA
$\mu(g1-g2)$	50		
μ		20	
r_a		4	kΩ
g_m	6.0	5.0	mA/V

CAPACITANCES

c_{g1-all}	4.5 approx.	pF	c_{gt-kt}	3.0	pF
c_{ap-all}	4.0 approx.	pF	c_{at-kt}	0.5	pF
c_{ap-g1}	$\ngtr$ 0.02	pF	c_{at-gt}	2.0	pF


LZ319.
V_a = 170
V_{g2} = 170
R_{g1} = 100kΩ
R_k = 220Ω
2
1
0
g_c (mA/V)
2
4
6
Vosc (RMS)

The Osram LZ319/PCF80 is a triode-pentode designed principally for use as a frequency changer for signal frequencies up to 250Mc/s and it is therefore suitable for use in Band III television receivers and converters.

Both triode and pentode sections have high mutual conductance and, consequently may be used for a variety of applications. This supplement describes its use as frequency-changer.

The circuit given has been designed for optimum performance with signal frequencies of the order of 250Mc/s and an IF of 34Mc/s approx.

The triode section oscillates at a frequency equal to the incoming signal frequency plus the IF and, normally, a grid current of 200–400µA is to be expected through the oscillator grid resistor R5. The oscillator voltage is fed to the pentode signal grid via the 2pF capacitor, C6, and here it mixes with the input signal from the tuned circuit composed of L1 and the input capacitance of the LZ319/PCF80. A grid current of approximately 5µA will flow through the mixer signal grid resistor R1, due to the voltage produced by the oscillator and this permits a convenient measurement of oscillator voltage, which should be between 2 and 3V rms.

The screen grid is supplied by a series resistor of 56kΩ, R3, and tied to the chassis by a 1000pF capacitor, C3. It is essential that this capacitor and C2 be non-inductive; the feed-through type have been found satisfactory.

The 100Ω cathode resistor, R2, and the 1000pF cathode by-bass capacitor are not essential and satisfactory results have been obtained without them, provided the screen is fed through a series resistor (R3) of 56kΩ.

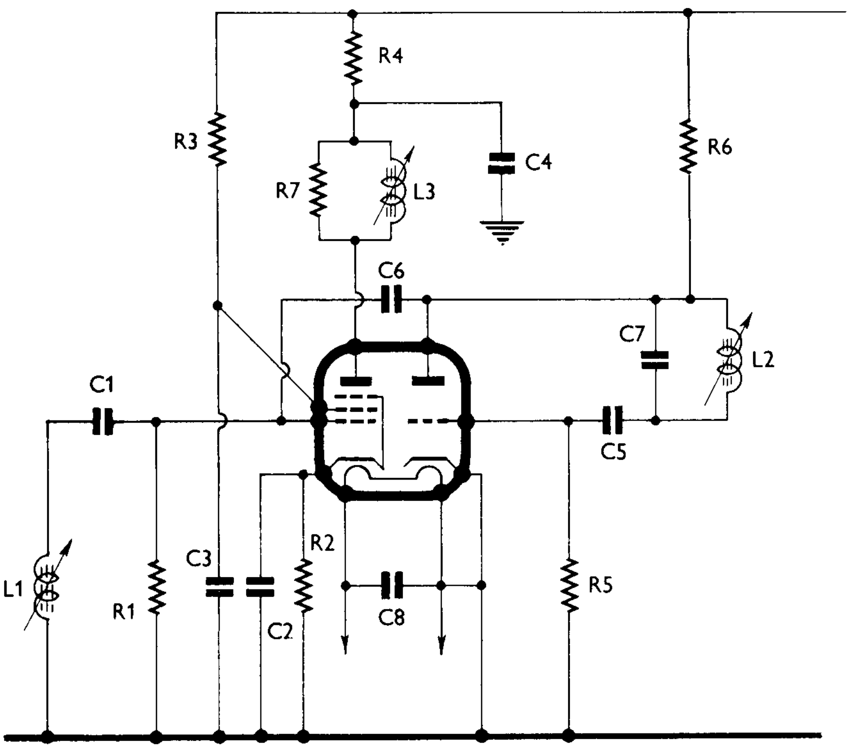
The anode of the pentode is connected to HT via a circuit tuned to the required IF. A damping resistor, the value of which is decided by the degree of damping required, is shown connected across the tuned circuit to maintain the desired bandwidth.

The oscillator frequency is determined by the inductor L2 and capacitor C7. Different values will be required according to the frequency desired, but for an oscillator frequency of 220–250Mc/s, a 4·7pF capacitor is suitable. L2 will then be formed of 2¼ turns of 16 or 18 swg wire on a 7mm dia. former (Neosid 351/8BA) with a dust core (Neosid 500/901).

It is essential in the interests of frequency stability to use adequate capacitance; however, a balance must be struck between frequency stability and oscillator voltage since too high a capacitance will prevent satisfactory oscillation.

All connecting leads, particularly the cathode and screen connections, should be of minimum length.

LZ319/PCF80



R1	470kΩ	20%		C1	47pF	
R2	100Ω	10%		C2	1000pF	Feed-through.
R3	56kΩ	10%		C3	1000pF	Feed-through.
R4	1kΩ	20%		C4	1000pF	Silvered mica.
R5	33kΩ	20%		C5	100pF	
R6	10kΩ	10%		C6	2pF	
R7	Damping resistor.			C7	4·7pF	High stability.
(All resistors: 0·25W)				C8	47pF	

See text for L1, L2, L3.